

Federal Aviation Agency

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CATEGORY II OPERATIONS - GENERAL AVIATION AIRPLANES

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GENERAL OPERATING
AND FLIGHT RULES

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SUBJECT : CATEGORY II OPERATIONS - GENERAL AVIATION AIRPLANES

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1. PURPOSE. This advisory circular sets forth acceptable means by which Category II operations may be approved in accordance with FAR Parts 23, 25, 61, 91, 97 and 135. Consideration will be given to any other means the applicant may present.
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Director
Flight Standards Service

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1. INTRODUCTION. This advisory circular sets forth acceptable means by which Category II operations may be approved in accordance with FAR Parts 23, 25, 61, 91, 97 and 135. Consideration will be given to any other means the applicant may present.
2. APPLICABILITY. This circular applies to airplanes to be used in Category II operations under Part 91. However, it does not apply to air carriers or commercial operators certificated under Part 121.
3. DEFINITIONS. As used herein, the following definitions apply.
 - a. Category II Pilot Authorization: A part of the holder's instrument rating or airline transport pilot certificate (but separately issued) that authorizes the holder to conduct Category II operations as pilot in command of specified types of airplanes.
 - b. Evaluation Program: An operational program based on a series of demonstration flights to establish the capability of the flight control guidance system to perform satisfactorily in Category II operations.
 - c. Category II ILS System: An Instrument Landing System (ILS) which provides usable guidance information from the coverage limit of the ILS to the point at which the localizer course line intersects the glide path at a height of 50 feet or less above the horizontal plane containing the ILS runway.
 - d. Inspection and Test Program: An engineering inspection and test program to determine compliance with: (1) Applicable airworthiness standards set forth in regulations, technical standard orders, or other pertinent specifications approved by the Federal Aviation Administrator; or (2) military standards or a foreign government's validation found to be compatible with the appropriate Federal Aviation Regulations (FARs).

4. GENERAL. Approval for Category II operations will require regulatory compliance in three major areas. These areas are airborne equipment and systems approval, crew qualification, and the approval of a Category II manual which includes a maintenance program. Airborne equipment and system approval may be accomplished by the airplane manufacturer or through later modifications by persons or organizations who perform this service. In some of these cases, the owner will acquire an airplane which has equipment and systems that meet the performance standards but which does not have the required Category II manual. While it is the operator's responsibility to submit the required Category II manual for approval, the actual preparation of the Category II manual may be accomplished by the airplane manufacturer, an organization or person engaged in airborne equipment and systems modifications to Category II standards, or a manufacturer of airborne equipment and systems. Category II manuals which originate from these or other suitable sources may be submitted by the airplane operator for approval under the same conditions as a manual prepared by the operator. A pilot in command holding a current and appropriate letter of authorization must also be utilized. The responsibility to meet the experience, proficiency, recency of experience, and renewal requirements for a letter of authorization rests primarily with the pilot seeking or holding such a letter. It is the responsibility of the operator (pilot in command) to utilize the services of a qualified second in command in the conduct of a Category II approach. Use of the second in command pilot is predicated on a prior determination by the pilot in command that the individual, in addition to meeting the requirements of FAR 61.3(g)(2), is also familiar with and capable of performing the second in command duties set forth in the approved Category II manual.

a. Airborne Equipment and System Approval.

- (1) The primary airborne equipment and system to be approved is the flight control guidance system and, at the option of the individual or organization seeking such approval, may be accomplished by:
- (a) Type certification or supplemental type certification in accordance with the procedures and criteria set forth in Attachment 2 to this advisory circular; or
 - (b) Completion of a satisfactory operational evaluation program described in Appendix A to FAR 91, discussed in more detail in paragraph 5 of this advisory circular.

- (2) The other instruments and equipment required by Appendix A, Section 2 of FAR 91, may be determined to be capable of performing as necessary for Category II operations during either of the programs referred to in paragraphs 4a(1)(a) or (b), above.
 - (3) When a radio altimeter is installed for use as the primary means to establish the 100-foot decision height, it must meet the performance criteria set forth in Appendix A, Section 3(c) of FAR 91 based on engineering assistance to verify compliance.
- b. Category II Approach Procedures. Category II ILS instrument approach procedures will be issued by the Federal Aviation Administration, and
- (1) Will be published in accordance with FAR Part 97, and
 - (2) Will be made available to the public in the same manner as other published instrument approach procedures.

Category II approach procedures may also be prescribed by other appropriate authority including the Armed Forces of the United States and foreign governments.

5. EVALUATION PROGRAM. The equipment to be evaluated for approval will be the flight control guidance system. This program provides a method of approval for those airplane owners or operators having airplanes equipped with a flight control guidance system not approved under an appropriate type or supplemental type certificate. Satisfactory completion will demonstrate that the equipment performs to the standards and with the reliability necessary for Category II operations.
- a. The procedures and requirements for conducting an evaluation program are prescribed in FAR Part 91, Appendix A, Section 3(e). In this regard, the following should be considered:
- (1) When inner marker receiving equipment is to be used as the primary means for identification of the 100-foot decision height, its use for evaluation approaches on a Category II ILS will pose no problem when the ground equipment is installed and operable. However, in the absence of operable inner marker ground equipment, it will be necessary to rely on barometric altimeters required by FAR 91, Appendix A, Section 2(a)(5). These altimeters will be acceptable under that section if:
 - (a) The altimeters and their static systems meet the requirements of FAR 91.170 within the past 12 months, and

- (b) Altimeter correction data is available to the pilot in command, which considers both scale error and main landing gear wheel height of the airplane. Scale error is determined by an altimeter test and inspection under FAR Part 43 Appendix E, and the wheel height correction is necessary only if the wheel to instrument height is in excess of 10 feet presently allowed for in U.S. Weather Bureau altimeter settings provided for aircraft. For instance, a large aircraft which has a 19-foot wheel to instrument height would require a 9-foot correction under this rule.

Barometric altimeters meeting (a) and (b) above are acceptable for Category II operations to establish decision heights down to 150 feet.

- (2) If a success rate of 90 percent is not achieved during the first 50 approaches, additional demonstration approaches may be conducted until this rate has been reached. The demonstration approaches should be recorded on a suitable form developed by the operator in order to facilitate evaluation. (See Attachment 3 for example.)
- (3) Should an applicant find at any time that the evaluation program is not producing the desired degree of success, it is suggested that a careful analysis of the problem be made in coordination with the General Aviation District Office (GADO). Although the regulations applicable to the evaluation program do not require observation of any of the approaches by an FAA inspector, experience with other evaluation programs indicates that at least 50 percent of the approaches required by the rule should be observed.
- (4) The regulations do not require a pilot in command conducting an evaluation program to be a qualified applicant for a Category II pilot authorization, although many pilots participating in evaluation programs will be those ultimately issued authorizations. However, it is recommended that only pilots meeting the experience requirements for that authorization be utilized.
- (5) Although it is desirable that at least one of the three ILS facilities referred to in FAR Part 91 Appendix A, Section 3(e)(2), meet Category II criteria, it is not a regulatory requirement.
- (6) **All evaluation approaches must be conducted under simulated IFR conditions and prior approval must be obtained from the controlling air traffic control (ATC) facility. In requesting approval, identify the approach as an "evaluation approach."**
- (7) The evaluation program should be utilized to help develop and establish appropriate operational procedures and techniques for inclusion in the Category II manual.

- (8) Displays associated with normal and abnormal functioning of the flight control guidance system should be evaluated to determine if they provide the crew with information suitable for Category II operation.
 - (9) Other system or equipment revisions should be made where needed to remove limitations which are not compatible with Category II operations. Operators now possessing airplanes equipped with autopilot installations should be aware that altitude loss data in the approach configuration now contained in the approved airplane flight manual may preclude operations to a 100-foot decision height. Advisory Circular No. 23.1329-1, Automatic Pilot Systems Approval (Non-Transport), and Advisory Circular No. 25.1329-1, Automatic Pilot Systems Approval (Transport), set forth an acceptable means by which automatic pilot installations may meet the requirements of FARs 23 and 25 respectively.
- b. Airplanes will be approved to engage in Category II operations when:
- (1) A satisfactory evaluation program has been completed, and
 - (2) A suitable Category II manual, including a maintenance program, has been submitted and approved.

6. CATEGORY II MANUAL.

- a. Category II operations involve the airplane owner or operator, the maintenance personnel and facilities, and the flight crews. Each has certain responsibilities to others involved as well as his own individual responsibility. FAR 91.34(a) specifies that no person may operate without an approved Category II manual for the aircraft.
- b. The purpose of the Category II manual is to set forth in a single document basic responsibilities, limitations, operational procedures, maintenance programs and related instructions. To assist applicants in the preparation of a Category II manual, Attachment 1 has been prepared as a guide in format and content subject to revision by the applicant as appropriate to the specific equipment and procedures intended to be employed in Category II operations.
- c. To receive formal approval, the Category II manual must contain that information specified in FAR 91, Appendix A, Section 1(b), and must be submitted in accordance with the instructions provided in Section 1(a) of Appendix A of FAR 91. Operators of turbojet aircraft should provide in the operating instruction portion of the approved Category II manual minimum runway length for use at the destination airport. The agency has issued Advisory Circular No. 91-10, Suggestions for use of ILS Minima by General Aviation Operators of Turbojet Aircraft. This Circular may be used as reference for preparation of the manual material, or, if the operator desires, be incorporated as Category II manual material in the operating instruction section of the manual.

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- d. The regulations under which Category II airborne equipment and systems are approved and authorized for use are silent on the transfer of ownership of the airplane in which the equipment is installed. The authorization to conduct Category II operations by the new owner does not require reapplication or reapproval of the airborne equipment or systems and is only contingent upon compliance with the applicable regulations and the procedures, limitations and maintenance program set forth in the approved Category II manual for the airplane involved. It follows that the airplane purchaser should arrange for transfer of the approved Category II manual with the airplane. Prior to engaging in Category II operations, the new owner should review the approved Category II manual to determine if the content of the manual, including the maintenance program, is compatible with his capabilities and operational requirements. In the event the Category II manual requires revision, those which are necessary or desirable should be submitted for approval to the General Aviation District Office in whose area the airplane is based.

7. PILOTS.

- a. Pilots complying with the experience and skill requirements of Federal Aviation Regulations 61.36 and 61.37A respectively will be authorized to conduct Category II operations. Since they will not receive a new certificate or rating, applicants for a Category II pilot authorization are not required to comply with FAR 61.21 which establishes prerequisites for certain examinations and tests.
- b. Category II Pilot Authorizations - Application.
 - (1) FAA Form 342, or FAA Form 8460-1 if available, will be used for pilot applications and submitted to the General Aviation District Office appropriate to the pilot's base of operation or convenient to the location of the airplane to be utilized for the oral operational test and practical test.
 - (2) It will be necessary to present at the time of application a pilot logbook to establish compliance with the experience requirements of FAR 61.36.
- c. Category II Pilot Authorizations - Skill Requirements.
 - (1) At the time of the oral and practical tests, it will be necessary to have available for use an airplane for which a Category II manual has been approved, and which otherwise meets the operating requirements of FAR Part 91 for Category II operations.
 - (2) The approved Category II manual for the airplane to be flown will be used in conducting both the oral and practical tests.

- (3) As a part of the practical test, the applicant will be asked to demonstrate his ability to determine that the duties assigned to the second in command are satisfactorily performed. For necessary reasons associated with testing the applicant's ability to perform the maneuvers required for the flight test, the applicant of course, must perform the maneuvers. This procedure may be contrary to the duties assigned to the second in command in the Category II manual. For this reason, we wish to make it clear that the manner in which the flight test must be conducted does not in any way indicate a position by the FAA as to the proper allocation of duties that are otherwise assigned to the second in command. It should be understood that the pilot serving as second in command during the practical test for the pilot in command must hold an appropriate class rating and, in the case of a large airplane or a small turbojet airplane, a type rating for that airplane.
- (4) During Phase I, Oral Operational Test, the pilot in command will be expected to demonstrate a satisfactory level of knowledge with respect to those items specified in FAR 61.37A(c)(1). Particular emphasis will be placed on a knowledge of the procedures, instructions and limitations set forth in the approved Category II manual required by FAR 91.34(a)(1).
- (5) The flight maneuvers and the manner in which they are to be performed are described in FAR 61.37 A and (c)(2). Applicants may employ any suitable hooded device that will effectively prevent outside visual reference during the flight test maneuvers.

d. Category II Pilot Authorization - Issuance, Limitations and Renewal.

- (1) Issuance. A Category II pilot authorization will identify the following:
 - (a) The airplane, by type, for which the authorization is valid. (Large airplanes by type are listed in Advisory Circular No. 61-1 (current issue). Small airplanes manufactured under the same type certificate issued the airplane manufacturer may be considered as being the same basic type for purposes of issuance or renewal.) and
 - (b) The holder by name, type of certificate, and date of issue.

NOTE: See Attachment 4, Example of Category II Pilot Authorization.

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- (2) Limitations. Upon original issue, the authorization will contain a limitation for Category II operations of 1600 feet RVR and a 150-foot decision height. This may be removed when the holder shows that he has made three Category II ILS approaches to a landing under actual or simulated instrument conditions with a 150-foot decision height since the beginning of the 6th preceding calendar month.
- (3) Renewal. Renewal of a Category II pilot authorization may be accomplished by passing the practical test prescribed in FAR 61.37 A at any time, in accordance with the renewal provisions of FAR 61.10. To retain semi-annual continuity, it may be renewed during the calendar month in which it would expire or during the preceding calendar month.

NOTE: The regulations, specifically those relating to the maintenance program set forth in the approved Category II manual, allow substitution for each alternate inspection of a functional flight check conducted by a pilot holding Category II authorization for the type airplane being checked. When this procedure is employed, the pilot should be familiar with that portion of the maintenance program to the extent that the functional flight check is conducted in accordance with the instructions and procedures contained in the approved Category II manual, and the results entered in the maintenance records. The regulations also require any discontinued Category II approach resulting from a malfunction of any Category II instrument or item of equipment to be entered in the maintenance records.

8. MAINTENANCE PROGRAM. Each applicant for Category II authorization submits for approval a maintenance program for installed Category II instruments and items of equipment which is to be included in the Category II manual of each airplane to be maintained under that program. The overall objective of a Category II maintenance program is to assure that the operator has considered all special maintenance requirements imposed by the operations to lower minimums, has geared his organization or operation to cope with them, and has documented them in his application. An acceptable program should contain a means of assuring that the required instruments and items of equipment can reasonably be expected to continue to operate at the level of performance upon which Category II approval is based. Attachment 1, Sections IV through VIII, contain general guidance material which may be used to develop the maintenance program portion of a Category II manual. The material should not be considered a complete program, but only a means of assistance in the preparation of a program. Reference will be made to various pages of Attachment 1 in the following paragraphs. The notes on those pages are additional information and not a part of the examples shown. Where typical examples of equipment lists, records of bench checks prior to application, inspections, flight checks, bench check schedules, etc., are shown in Attachment 1, Sections IV through VIII, they are to be considered only as guidance in preparing the maintenance program.

- a. Aircraft Electrical Capacity. In developing a Category II equipment and maintenance program, consideration should be given to the capacity of the airplane's electrical generating system. The system should be capable of supplying electrical power to all required instruments and items of equipment during Category II operations without limits on the applied electrical load.
- b. Instruments and Equipment Approval. Before presenting an airplane for approval of the instruments and equipment, it must be shown that, since the beginning of the 12th calendar month before the date of submission, the equipment required in FAR 91, Appendix A, Section 2(a), has been bench checked, tested, or inspected according to the standards and methods contained in FAR 91, Appendix A, Section 3. A list of installed Category II instruments and items of equipment, including make and model of those specified in FAR 91, Appendix A, Section 2(a), must be included in the Category II manual. A means of submitting this information is shown in Attachment 1, Section IV, pages 24 and 25. These pages also show that the static pressure system was tested and inspected since the beginning of the 12th calendar month before the airplane is presented for approval of instruments and items of equipment.
- c. Maintenance Schedule. Category II instruments and items of equipment are divided into Groups I and II (FAR 91, Appendix A, Section 2) according to maintenance requirements. Those listed in Group I require bench checks within 12 calendar months after the date of the previous bench check. Group II instruments and equipment with the exception of the static system do not require special maintenance procedures other than those necessary to retain the original approval condition. A typical schedule for inspections, flight checks, and bench checks is shown in Attachment 1, Section V, page 31.
- d. Inspections. An inspection is to be performed on each Group I item of equipment within three calendar months of the previous inspection using procedures contained in the approved maintenance program. Inspection procedures should be shown adequate to determine that the equipment as installed will perform as approved for Category II operations. Self-test features may be submitted for approval. Instructions for their use and interpretation of self-test indications should be contained in the maintenance program. Inspections are performed by a person authorized by FAR Part 43, except that a functional flight check may be substituted for each alternate inspection and is performed by a pilot holding a current Category II pilot authorization for the type airplane being checked. In addition to performing the functional flight checks of Group I equipment, the pilot should check any other equipment capable of being tested in flight. Typical inspections and functional flight check procedures are shown in Attachment 1, Sections VI and VII.

- e. Bench Checks. Maintenance standards, practices, and limitations established in obtaining original equipment approval may be used for initial bench check and inspection standards. If it is determined later that these standards and practices will not maintain the equipment to Category II approval performance standards, the operator should establish additional tests, inspections and checks, more rigid calibration procedures and tolerances, etc., in order to retain these performance standards. All such changes which alter the approved maintenance program must be approved by the Federal Aviation Administrator. Typical bench check procedures are shown in Attachment 1, Section VIII. The equipment manufacturer's maintenance procedures may be incorporated in the bench check portion of the program by reference to the manufacturer's manual title and number if those procedures are found adequate to maintain the ability of the equipment to perform as approved for Category II operations. If exceptions to the manufacturer's maintenance procedures are required to meet Category II performance standards, they should be indicated as such in the maintenance program. An example is shown in the bench check procedure for the Ajax Model 22-G glide slope receiver in Attachment 1, Section VIII, page 55.
- f. Altimeter and Static System. If the 12-month altimeter bench check and static system test and inspection is entered in the airplane maintenance records, the requirements of FAR 91.170 will be met.
- g. VOR Receivers. If the VOR receiving system(s) are included in the approved maintenance program, the requirements of FAR 91.25(a)(1) will be met.
- h. Repairs. The Category II manual should contain a procedure for assuring that repairs performed on listed instruments and items of equipment will return the equipment to at least its original Category II approval condition before the airplane is used for Category II operations. The procedure should include a positive means to notify the pilot in command when a listed instrument or item of equipment has not been so repaired. Examples of such forms and procedures have not been included in Attachment 1, Section V, because such procedures will have to conform to particular company organization.
- i. Replacement. The Category II manual should contain a procedure to assure that equipment replaced with the same make, model, and design will provide system performance at least equal to Category II approval condition.
- j. Alterations. All alterations to equipment that is required by FAR 91, Appendix A, Section 2, are approved by the FAA under the provisions of Section 3(b), (c), and (d) of that Appendix.

- k. Records. All tests, inspections, and bench checks performed on required equipment should be entered in the maintenance records required by FAR 43.9. Functional flight checks, although performed by pilots, must also be entered in the maintenance records in accordance with FAR 91, Appendix A, Section 4(a)(5). A separate record form for each item of equipment may be used if desired. Maintenance performed on this equipment at other than scheduled intervals must also be entered in the airplane maintenance records. In addition, an entry in the maintenance records is required showing the date, airport and reason for each discontinued Category II approach because of a malfunction of a listed instrument or item of equipment. Such forms could also be used to record instrument and equipment malfunctions and failures occurring at times other than Category II operations if a means is provided to identify malfunctions occurring during Category II approaches. A method of recording scheduled inspections and bench checks, and discontinued Category II approaches is shown on pages 32 and 33 of Attachment 1, Section V. Space has been provided to identify the malfunctioning equipment and a description of the malfunction.
1. Maintenance Period Extensions. Operators may apply for extension of check, test and inspection periods after one 12-calendar-month maintenance cycle has been completed. In order to justify the extension, equipment performance and service history should show that the extension will not adversely affect the required level of performance of the Category II instruments and equipment. Application for extensions should be made by letter to the General Aviation District Office having jurisdiction of the area in which the operator is located. The following data should be made available:
- (1) The currently approved maintenance program.
 - (2) Records of Category II approaches discontinued due to malfunctioning equipment.
 - (3) Number of actual and simulated Category II approaches completed during the past maintenance cycle, if available.
 - (4) Maintenance records of Category II equipment failures.
 - (5) Service history of known trends toward malfunctioning.
 - (6) Unit mean flight time between failures.
 - (7) Records of functional flight checks.

- m. Time Increase. Equipment performance and reliability, as determined by evaluation of the data submitted with the application for extension, will be major factors in determining the amount of maintenance period extension to be granted. Extension periods in most cases would be one calendar month for inspections and functional flight checks and four calendar months for bench checks.

Attachments 4